The influence of anxiety, hostility and type D personality on health behaviors of university students

Artemisa R. Dores[1], Débora Barros[1], Ana Brito[2], Suveer Singh[3], Ricardo Teixeira[4]

1. School of Health, Polytechnic of Porto. Porto, Portugal. artemisadores@gmail.com
2. Chelsea and Westminster Hospital NHS Foundation Trust. London, United Kingdom.
3. Imperial College London, Faculty of Medicine. London, United Kingdom.
4. Clínica Médico-Psiquiátrica da Ordem. Porto, Portugal.

ABSTRACT: Interest in type D personality and negative emotions such as anxiety and hostility has been growing. These factors are associated with health risk behaviors, which could determine the incidence and progression of cardiovascular disease in initially healthy individuals. We sought to evaluate the prevalence of anxiety, hostility and type D personality and its influence on health risk behaviors in a cohort of university students. One hundred and fifty-one students completed five questionnaires. Mixed methodology using Pearson's correlation, and regression analysis determined associations between risk factors and health behaviors. We observed a mild hostility and anxiety disturbance (M=0.95; SD=0.61 and M=0.91; SD=0.70). Type D personality was present in 37.7% of the participants. There was a positive association between hostility and smoking (r=0.168; p=0.04), alcohol (r=0.215; p=0.008) and coffee consumption (r=0.280; p=0.000), as well as a negative association between hostility and anxiety (r=-0.263; p=0.001), type D personality (r=-0.194; p=0.017) and lifestyle (r=-0.306; p=0.000). Besides gender variables, alcohol consumption, coffee intake, physical exercise, diet and type D personality assumed statistical relevance explaining the health behaviors (p<0.05). Based on these results we argue that college students may benefit from a premature evaluation for the prevention of future cardiovascular disease.

Keywords: Anxiety; Hostility; Type D personality; Cardiovascular disease; Risk behavior

A influência da ansiedade, hostilidade e personalidade tipo D em comportamentos de saúde de estudantes do ensino superior

RESUMO: O interesse pela personalidade do tipo D e por emoções, como a ansiedade e a hostilidade, tem crescido. Estes fatores estão associados a comportamentos de risco para a saúde que podem determinar a incidência e a progressão de problemas cardiovasculares em indivíduos inicialmente saudáveis. Neste trabalho estudou-se a prevalência da ansiedade, da hostilidade e da personalidade tipo D e a sua influência em comportamentos de risco para a saúde numa amostra de estudantes do ensino superior. Participaram 151 estudantes que responderam a cinco questionários de autorrelato. Uma metodologia mista, com correlação de *Pearson* e análise de regressão, evidenciou uma associação entre fatores de risco e comportamentos de saúde. Observou-se hostilidade moderada e perturbação da ansiedade (M=0,95; DP=0,61 e M=0,91; DP=0,70). Dos participantes, 37,7% apresentaram personalidade do tipo D. Verificou-se uma associação positiva entre hostilidade e tabagismo (r=0,168; p=0,04), consumo de álcool (r=0,215; p=0,008) e de café (r=0,280; p=0,000), bem como uma associação negativa entre hostilidade e ansiedade (r=-0,263; p=0,001), personalidade tipo D (r=-0,194; p=0,017) e estilo de vida (r=-0,306; p=0,000). As variáveis género, consumo de álcool, ingestão de café, exercício físico, dieta e personalidade tipo D assumiram relevância estatística na explicação de comportamentos de saúde (p<0,05). Com base nos resultados defende-se que os estudantes do ensino superior podem beneficiar de uma avaliação precoce das variáveis identificadas neste estudo, no sentido da prevenção de futuras doenças cardiovasculares.

Palavras-chave: Ansiedade; Hostilidade; Personalidade tipo D; Doença cardiovascular; Comportamento de risco

Introduction

Several studies show an association between type D personality and negative emotions such as anxiety and hostility, and the incidence and progression of cardiovascular disease (CVD)[1-2]. Type D personality is also defined as having a high score on two stable personality traits, negative affectivity and social inhibition[3].

Anxiety consists of a complex sequence of cognitive, affective and behavioral events triggered by stress-inducing stimulus[4-5].

Prospective studies show that negative emotions act as a risk factors (RFs) on the incidence of coronary heart disease (CHD), leading to stroke or cardiac insufficiency on healthy individuals[1,6]. A distressed personality type D profile is a vulnerability factor for general psychological distress that affects mental and physical health status and has been found to be an important determinant of outcomes in cardiac patients[7].

One of the proposed mechanisms to explain the relation between anxiety and CVD has been the association of anxiety with risk behaviors such as smoking, poor diet and a sedentary lifestyle[8-9].

Hostility is a personality trait associated with type A behavior, which is characterized by a negative attitude and suspicion towards others[2,10]. The epidemiological results prove the association between hostility and CHD[10]. For example, individuals with high hostility revealed to smoke more, consume more caffeine, alcohol and animal fat when compared to individuals with low hostility[11].

Recently, other type of personality has been studied, the type D, which is more inclined to have psychological distress resulting from a combination between negative affectivity and social inhibition. This personality is an emergent RFs in CVD and has been associated with a greater incidence of anxiety[12]. This type of behavior has been associated with a sedentary lifestyle, an unhealthy diet, smoking and a high body mass index[13-14].

A study conducted among students in the medicine faculty shows that female participants showed higher responses to stress such as anxiety and anger. A positive correlation was confirmed between the intensity of the stress responses and lifestyles[15]. Studies show that the early assessment of psychological disorders such as depression and anxiety in university students significantly reduces risk behaviors such as smoking, drinking alcohol or eating disorders[15-17].

Much research has been conducted with medicine students. However, little is known about students in health technologies (AHT) programs. With this work we sought to assess a population of university students, particularly from the areas of health technologies. This group has not been well investigated before and may benefit from the early detection of important RFs. The main goal of this study was to assess the prevalence of anxiety, hostility and type D personality, and its influence on health risk behaviors in this population.

As specific goals were aimed to: (1) determine the existence of associations between anxiety, hostility, type D personality and RICH variables (relaxation, insight, contact, and harmony), lifestyle, body mass index (BMI), smoking, alcohol consumption, caffeine consumption, diet, physical exercise and gender; (2) verify the existence of differences in lifestyles among genders; and (3) study the main behavioral predictors of health/lifestyles.

Methods

Participants

One hundred and fifty-one graduate students of a Portuguese school of health. Of this cohort, 87.4% were female (*n*=132) and 12.6% (*n*=19) were male. Their mean age was 20.97 years (SD=2.88; Min=18; Max=39).

Instruments

Five self-report questionnaires were filled by the participants.

The socio-demographic and clinical variables' collection questionnaire was made by the researcher to gather data regarding gender, weight, height, past or current history of physical or psychological disorders, medication and diet.

The Higher Education Lifestyles Questionnaire (QEVES) was used to assess healthy behaviors on higher education's young adults and is composed of 36 items. The rating is done through the sum of the score in each item. The items related to non-healthy lifestyles are counted negatively. From the sum of the items a total is obtained, varying between 36 and 180; the highest it is, healthier is the lifestyle. The Cronbach's Alpha for the item set is 0.81 which confirms the good consistency of the internal scale[18].

The analogic visual scale RICH, an innovative tool recently developed in Portuguese was used to assess four effects of conscience, namely relaxation, insight, contact and harmony[19]. These are interrelated and form the RICH model of direct central conscience effects, functioning as intermediate pathways which lead to well-being's associated effects[19]. This scale has a two weeks' recall period. For each one of the four scale variables is obtained a value that may vary between 1 (nothing) and 10 (completely).

The Symptom Checklist-90-Revised (SCL-90-R) is a questionnaire with 90 grouped items in nine subscales[20]. On this study were used only the hostility and anxiety subscales. The result is obtained by summing the items' rating, to divide by the number of items. The result allows the classification of absent (0), mild (1), moderate (2), severe (3), and highly severe (4) disorder. SCL-90-R represents appropriate levels of internal consistency and for the Portuguese population, Baptista's data shows an average of .79 (SD=0.60) in the hostility subscale and an average of .67 (SD=0.48) in the anxiety subscale[21].

Type D personality was assessed through the DS-14 questionnaire, translated into the Portuguese language but not gauged[22-23]. It consists of two subscales of seven items, each for assessment of negative affectivity and social inhibition. To each item a score is attributed being the items one and three of inverted rating. According to the reported by Denollet[23], individuals with a score equal or superior to 10 in both scales are classified as type D. The negative affectivity and social inhibition subscales presented in two samples from

the Portuguese population respectively, α=0.87; α=0.66 and α=0.81; α=0.85, indicating good reliability[22,24].

Procedure

This cross-sectional and observational study was performed at a Portuguese school of health. The distribution of the questionnaires was made to the students of undergraduate courses, having been included on the convenience non-probability sample all students with an age superior to 18 years, which were enrolled at the moment of application of the questionnaire in any of the academic years of the undergraduate courses and that volunteered to participate in the study.

Data analyses

The IBM® SPSS® Statistics 19.0 software was used for the statistical analysis and a significance level of $p<0.05$ was considered statistically significant. In this study were used the STROBE guidelines for execution of observational studies' reports[25]. After testing for normality, Pearson's correlation, the point-biserial correlation, Chi-Square test for independence, t-test for independent groups and hierarchical multiple linear regression in response to the study's objective.

The protocol was approved by the local ethics committee, and complies with the Declaration of Helsinki. The informed, free and clarified consent was signed by all participants. This study had no financial or commercial purposes.

The questionnaires and scales' authors have been contacted in order to request permission to use the tools, which was granted.

Results

The BMI ranged from 16.65 to 35.16. The majority of the students presented a BMI between 18.5 and 24.4 which is inside the normal weight (87.2%; *n*=129). Only 3.4% (*n*=5) of the students presented a weight above the normal range, 8.1% (*n*=12) of the students presented overweight and 1.4% obesity (*n*=2).

The majority of the participants stated not having any physical or psychological disorder (96.7%; *n*=146); 3.3% (*n*=5) stated that they had depression, scoliosis and visual or auditory impairment. The majority of the students did not describe taking any prescribed medicine (88.7%; *n*=134). Only one student stated to have been taking medication for anxiety (0.7%) and two students (1.4%) for depression.

Regarding diet, 69.5% considered themselves to have a healthy diet (*n*=105), 44 participants (29.1%) stated a less healthy diet and only two stated to have a poor healthy diet.

The internal consistency of the scales and subscales were assessed and a .74 Cronbach's Alpha was obtained for QEVES, which indicates an acceptable internal consistency despite being slightly inferior to the value obtained by Costa[18]. For the RICH scale Cronbach's Alpha of 0.74, an acceptable value which indicates that may be considered for this and other studies the RICH's dimensions. On the hostility subscale of the SCL-90-R was obtained an Alpha of 0.83 and on the anxiety scale an Alpha of 0.90. The internal consistency is equally high when tested both subscales together (α=0.91), showing the existence of a good consistency in each subscale as well as jointly. In the hostility subscale a mean of 0.95 (SD=0.61) and a mean of 0.91 (SD=0.70) in the anxiety subscale were obtained, being these values slightly higher than those obtained by Baptista[21].

In DS-14 an Alpha of 0.85 was obtained in the subscale of social inhibition, similar to other values[22,24]. In the subscale of negative affectivity, a lower but acceptable value was obtained (α=0.71), being superior to the value obtained by Sousa[22] and inferior to the obtained by Reia[24]. Regarding the scale's total, the Alpha value obtained was 0.83, which indicates a good internal consistency.

Regarding QEVES results a score between 109 and 171 was obtained, being the mean (M) 144.19 (SD=10.52), indicating that in general students lead a healthy lifestyle.

Concerning RICH'S scales dimensions, it was verified that in general, students felt relaxed during the two weeks of recall period studied (M=5.74; SD=1.82) and had frequently a clear notion of their thoughts and feelings (M=7.56; SD=1.65). It was frequent for them to feel in contact with themselves and their surroundings (M=7.34; SD=1.68), and to feel in harmony with themselves and their surrounding environment (M=6.79; SD=1.86).

In general, students present mild disorder at the level of hostility and anxiety (M=0.95; SD=0.61 and M=0.91; SD=0.70). At the level of hostility, the majority of the students presents a mild disorder (60.9%; *n*=92), 19.9% (*n*=30) have no disorder, 16.6% (*n*=25) present a moderate disorder and 2.6% (*n*=4) severe disorder. In regards to anxiety, 47% (*n*=71) of the students manifest mild disorder, 31.8% (*n*=48) have no disorder, 19.2% (*n*=29) present a moderate disorder and 2% (*n*=3) a severe disorder.

Concerning DS-14, it was verified that students manifest in general moderate levels of social inhibition (M=10.72; SD=5.32) and of negative affectivity (M=11.44; SD=5.99). Type D personality was present in 37.7% (*n*=57) of the participants.

In order to meet the study's goals, the usage of inferential statistics was made. The Kolmogorov-Smirnov test was used to test normality and, having been verified a normal distribution in all scales and subscales ($p<0.05$).

To meet the first goal, Person's correlation was made for the continuous variables and the point-biserial correlation for dichotomous variables (*cf.* Table 1).

BMI was not associated with hostility, anxiety, or with type D personality. Smoking only had a weakly positive correlation with hostility ($r=0.168$, $p=0.04$). There was a weak positive correlation between hostility, the consumption of alcohol and coffee ($r=0.215$, $p=0.008$ and $r=0.280$, $p=0.000$). Anxiety and type D personality did not have any association with the RFs. The correlations between hostility, anxiety, type D personality and QEVES's results showed a low-moderate yet significant, negative association ($r=-0.263$, $p=0.001$; $r=-0.194$, $p=0.017$ and $r=-0.306$; $p=0.000$). A moderate association between hostility and anxiety was observed ($r=0.595$, $p=0.000$). There was a moderate low and positive association between hostility and the presence of type D personality ($r=0.327$, $p=0.000$).

Table 1. Correlations between gender, hostility, type D personality, RICH, QEVES and the risk factors

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Hostility[a]	-															
2. Anxiety[a]	.595***	-														
3.Type D personality[b]	.327***	.330***	-													
4. Social inhibition[b]	.268***	.268***	.712***	-												
5. Negative affection[b]	.557***	.635***	.559***	.433***	-											
6. BMI[c]	-.008*	-.003	-.060	-.136	-.012	-										
7. Smoking[c]	.168*	-.025	-.090	-.157	-.004	.184*	-									
8. Alcohol consumption[c]	.215**	-.011	-.051	-.089	.053	.124	.234**	-								
9. Coffee consumption[c]	.280***	.132	-.033	-.138	.140	.041	.331***	.305***	-							
10. Diet[c]	.037	-.042	-.092	-.041	.006	.014	-.024	-.061	-.025	-						
11. Physical exercise[c]	-.016	-.104	-.150	-.300***	-.162*	-.045	-.029	.084	.053	.234**	-					
12. QEVES[d]	-.263***	-.194*	-.306***	-.255**	-.260***	-.131	-.235**	-.355***	-.309***	.598***	.319***	-				
13. Relaxation[e]	-.146	-.264***	-.195*	-.128	-.369***	-.040	-.040	.047	-.079	.176*	.226**	.221**	-			
14. Insight[e]	-.077	.017	-.017	.103	-.088	-.031	-.015	-.073	-.108	.198*	.057	.243**	.165*	-		
15. Contact[e]	-.200*	-.163*	-.206**	-.129	-.295***	-.022	-.001	-.144	-.089	.241**	.069	.382***	.236**	.656***	-	
16. Harmony[e]	-.252**	-.278***	-.363***	-.272***	-.494***	-.002	.061	-.254**	-.085	.285***	.109	.455***	.516***	.326***	.640***	-
17. Gender	.106	.173*	.007	-.035	.051	-.158	-.048	.016	.016	.003	-.182*	.138	-.011	-.064	.029	.033

Note: *p<.05. **p<.01. ***p<.001. [a]SCL-90-R. [b]DS-14. [c]Risk Factors. [d]QEVES. [e]RICH.

Anxiety and type D personality were moderately correlated (r=0.330, p=0.000).

There was a negative moderate-low association between hostility, contact and harmony (r=-0.200, p=0.014 and r=-0.252, p=0.002). Anxiety presented moderate-low negative association with relaxation (r=-0.264, p=0.001), contact (r=-0.163, p=0.045) and harmony (r=-0.278, p=0.001). Type D personality was associated with a less frequent response of feeling relaxed (r=-0.195, p=0.016), in contact (r=-0.206, p=0.011) and in harmony. There was a low significant correlation of female gender with anxiety (r=0.173, p=0.033).

To better clarify associations, the Chi-Square test for independence was used because of its adequacy for percentage comparison and verification of relations between qualitative variables. It was verified that at the level of anxiety the percentage of incidence is greater in male and female elements with mild disorder (57.9%; n=11 and 45.5%; n=60), being that on the female gender this difference is statistically significant (p=0.033).

To verify if lifestyle and the dimensions of the RICH scale vary with gender, the t-test was used to compare of means between two independent groups. There was no difference between genders for lifestyle (p=0.090). No significant differences were found between RICH's scale dimensions and gender (p>0.05), however, it was verified a pattern for relaxation and insight to be more slightly superior in men, and contact and harmony more evident in women.

To study the main predictors of the students' lifestyles, hierarchical multiple linear regression was used. For model 1 was obtained a really high correlation coefficient (R2=0.771), being the variation proportion explained by this model of 59% (R2=0.593), which is highly appropriate to explain the predictors of health behaviors. Through the standardized β value, it was observed a negative slope on the BMI, alcohol, coffee and smoking consumption variables. The slopes were positive in the gender, physical exercise and diet. Gender, alcohol consumption, coffee consumption, physical exercise and diet assumed a statistical significance (p<0.05) on the explanation of this model. For model 2 an even higher correlation coefficient (R2=0.820) was obtained, indicating that the variables' association is higher in this model. The explained variation proportion for this model is 67% (R2=0.672), thus, this leads to the conclusion that the variables of model 2 are the ones which have greater influence on the lifestyle. In this model, besides gender variables, alcohol consumption, coffee consumption, physical exercise and diet, type D personality also assumed statistical significance (p<0.05) (*cf.* Table 2).

Discussion and conclusion

The results show that in general, students lead a healthy lifestyle. It was found that, on average, students felt relaxed during the two weeks' recall period studied, had frequently sense of their thoughts and feelings, and felt in contact and harmony, being these results suggestive of general well-being.

Were there mainly mild hostility and anger traits, with very few severe traits. It was verified that the levels of hostility

Table 2. Assessment of the potential behavioral predictors of health/lifestyles (final model)

Variables	β	R^2	F	ΔR^2	ΔF
Bloc 1		0.594	29.48***	0.594	29.475***
Gender	.192***				
BMI[a]	-.057				
Alcohol consumption[a]	-.259***				
Smoking[a]	-.084				
Coffee consumption[a]	-.183***				
Diet[a]	.495***				
Physical exercise[a]	.220***				
Bloc 2		0.672	28.33***	0.078	11.013***
Hostility[b]	-.089				
Anxiety[b]	-.040				
Type D personality[c]	-.222***				

Notes: *p<.05. **p<.01. ***p<.001. [a]Risk Factors. [b]SCL-90-R. [c]DS-14.

don't differ statistically in relation to gender; however, the levels of anxiety were higher in the female gender, being that this association was expected and is in accordance with the results described by Loureiro et al[15].

The presence of type D personality in individuals was significant, however, on the contrary to the described by Einvik et al[13], it wasn't verified any association between BMI and type D personality. Weren't also found any associations between type D personality and physical exercise, smoking and diet, being these results the opposite of what was to be expected[12-14].

A positive significant weak correlation was identified between hostility, smoking, alcohol consumption and coffee consumption, results that are in accordance with the ones obtained by Knox et al[11], despite of not having been encountered any association between hostility and diet. A positive association between anxiety and poor diet, sedentary lifestyle and smoking was to be expected, but this wasn't verified[8-9]. Similarly, Ginting, van de Ven, Becker, & Näring study[26] revealed as well that, regarding health behaviours, type D individuals with CHD showed more addictive behaviours (more cigarettes and more alcoholic consumption), and that they were less likely to consume healthy food and were more likely to consume unhealthy food compared to non-type D individuals with coronary heart disease.

A moderate negative correlation between lifestyle and hostility, anxiety and type D personality was verified and allows to conclude that the better the lifestyle, lower are the hostility, anxiety and type D personality levels. A positive correlation between hostility and anxiety was found, which indicates that the greater the hostility, greater will be the feeling of anxiety. Type D personality and hostility are also positively related, indicating that greater levels of hostility are associated with the presence of type D personality. It was also verified that type D personality is associated to higher levels of anxiety, which confirms the results achieved by Spindler et al[12].

It was observed that hostility is related with contact and harmony, allowing to affirm that the lower the hostility levels, greater will be the frequency that students feel in contact and harmony. Anxiety presented itself associated with relaxation, contact and harmony, which allows affirming that anxiety is lower in students with greater levels of relaxation, contact and harmony. It was verified the association of type D personality with the decrease of the frequency that individuals feel relaxed in contact and harmony.

According to the results of the present sample it can be stated that higher BMI, alcohol, coffee and tobacco consumption are associated to a lesser healthy lifestyle, which may improve with the increase of physical exercise practice and a better diet. It can be assumed as lifestyle predictors in students, the consumption of alcohol and coffee, physical exercise, food diet, type D personality and gender.

The results of this study may have been influenced by the fact that it was conducted in an institution with a high number of female students, thus the collected sample being mostly composed of women. According to the literature, women lead a better lifestyle than men and students from the health area lead a better lifestyle than students from other areas[18,27]. These factors may have led to the attainment of greater well-being values and simultaneously, to lower risk behaviors. It is assumed that because of this factor only weak positive correlations were obtained between hostility and RFs, having not

being possible to observe any associations between RFs and anxiety and type D personality.

This study had as limitations the reduced number of male participants and data collection restricted to one university. In turn, the lack of studies about mental health and risk behaviors in students of health technologies in Portugal hindered the comparison of results.

Knowing that health is negatively affected by alcohol and coffee consumption in the long-term, by a sedentary lifestyle and a poor diet and that these RFs are found to be intimately related with the probability of CVD development; also given the associations found between lifestyle and hostility, anxiety and type D personality, and since alcohol and coffee consumption physical exercise, diet and type D personality may be assumed as predictors of students' lifestyles, it is concluded that this population may benefit from the early assessment and implementation of intervention or of psychological support programs in order to reduce risk behaviors and adopt and maintain an healthy lifestyle and to prevent the incidence of future CVD. Thus, it is suggested the performance of studies that involve students of different universities, in particular of the health area, and if the results of this study are reproduced, the adoption of measures for promotion and prevention of the students' physical and mental health must be worked on.

References

1. Denollet J, Nyklíček I, Vingerhoets AJ. Introduction: emotions, emotion regulation, and health. In: Vingerhoets A, Nyklíček I, Denollet J, editors. Emotion regulation: conceptual and clinical issues. New York: Springer Science; 2008. p. 3-11. ISBN 9780387299860
2. Everson-Rose SA, Lewis TT. Psychosocial factors and cardiovascular diseases. Annu Rev Public Health. 2005;26:469-500.
3. Bunevicius A, Staniute M, Brozaitiene J, Stropute D, Bunevicius R, Denollet J. Type D (distressed) personality and its assessment with the DS14 in Lithuanian patients with coronary artery disease. J Health Psychol. 2013;18(9):1242-51.
4. Batista MA, Oliveira SM. Sintomas de ansiedade mais comuns em adolescentes [Frequent anxiety symptoms of adolescents]. Psic: rev Vetor Edit. 2005;6(2):43-50. Portuguese
5. Hishinuma ES, Miyamoto RH, Nishimura ST, Goebert DA, Yuen NY, Makini GK Jr, et al. Prediction of anxiety disorders using the state-trait anxiety inventory for multiethnic adolescents. J Anxiety Disord. 2001;15(6):511-33.
6. Albert CM, Chae CU, Rexrode KM, Manson JE, Kawachi I. Phobic anxiety and risk of coronary heart disease and sudden cardiac death among women. Circulation. 2005;111(4):480-7.
7. Staniute M, Brozaitiene J, Burkauskas J, Kazukauskiene N, Mickuviene N, Bunevicius R. Type D personality, mental distress, social support and health-related quality of life in coronary artery disease patients with hear failure: a longitudinal observational study. Health Qual Life Outcomes. 2015;13:1.
8. Olafiranye O, Jean-Louis G, Zizi F, Nunes J, Vincent MT. Anxiety and cardiovascular risk: review of epidemiological and clinical evidence. Mind Brain. 2011;2(1):32-7.
9. Licht CM, de Geus EJ, van Dyck R, Penninx BW. Association between anxiety disorders and heart rate variability in The Netherlands Study of Depression and Anxiety (NESDA). Psychosom Med. 2009;71(5):508-18.
10. Chida Y, Steptoe A. The association of anger and hostility with future coronary heart disease: a meta-analytic review of prospective evidence. J Am Coll Cardiol. 2009;53(11):936-46.
11. Knox SS, Weidner G, Adelman A, Stoney CM, Ellison RC. Hostility and physiological risk in the National Heart, Lung, and Blood Institute Family Heart Study. Arch Intern Med. 2004;164(22):2442-8.
12. Spindler H, Kruse C, Zwisler AD, Pedersen SS. Increased anxiety and depression in Danish cardiac patients with a type D personality: cross-validation of the type D scale (DS14). Int J Behav Med. 2009;16(2):98-107.
13. Einvik G, Dammen T, Hrubos-Strøm H, Namtvedt SK, Randby A, Kristiansen HA, et al. Prevalence of cardiovascular risk factors and concentration of C-reactive protein in type D personality persons without cardiovascular disease. Eur J Cardiovasc Prev Rehabil. 2011;18(3):504-9.
14. Denollet J, Conraads VM. Type D personality and vulnerability to adverse outcomes in heart disease. Cleve Clin J Med. 2011;78 Suppl 1:S13-9.
15. Loureiro E, McIntyre T, Mota-Cardoso R, Ferreira MA. A relação entre o stress e os estilos de vida nos estudantes de medicina da Faculdade de Medicina do Porto [The relationship between stress and lifestyles in medical students of the Faculty of Medicine of Oporto]. Acta Med Port. 2008;21(3):209-14. Portuguese
16. Nash S, Sixbey M, An S, Puig A. University students' perceived need for mental health services: a study of variables related to not seeking help. Psychol Serv. 2017;14(4):502-12.
17. O'Brien AP, Cho MA, Lew AM, Creedy D, Man RH, Chan MF, et al. Need for mental health promotion and early intervention services for higher education students in Singapore. Int J Ment Health Promot. 2008;10(3):42-8.
18. Costa SI. Saúde e bem-estar na transição para o ensino superior: influência dos estilos de vida nos processos de adaptação [Dissertation]. Faro: Universidade do Algarve; 2008.
19. Nyklícek I, Vingerhoets A, Zeelenberg M. Mindfulness, emotion regulation, and well-being: a view from different angles. In: Nyklicek I, Vingerhoets A, Zeelenberg M, editors. Emotion regulation and well-being. New York: Springer; 2011. p. 1-9. ISBN 9781441969538
20. Derogatis LR, Cleary PA. Confirmation of the dimensional structure of the SCL-90: a study in construct validation. J Clin Psychol. 1977;33(4):981-9.
21. Baptista A. A génese da perturbação de pânico: a importância dos factores familiares e ambientais durante a

infância e a adolescência [Dissertation]. Porto: Instituto de Ciências Biomédicas Abel Salazar, Universidade do Porto; 1993.
22. Sousa CF. Personalidade tipo D, sentido interno de coerência e patologia na coluna vertebral [Dissertation]. Lisboa: Instituto Superior de Psicologia Aplicada; 2004.
23. Denollet J. DS14: standard assessment of negative affectivity, social inhibition, and type D personality. Psychosom Med. 2005;67(1):89-97.
24. Reia EL. Demora na procura de cuidados médicos em doentes com enfarte de miocárdio: percepção de sintomas e personalidade tipo-D [Dissertation]. Lisboa: Instituto Superior de Psicologia Aplicada; 2006.
25. von Elm E, Altman DG, Egger M, Pocock SJ, Gøtzsche PC, Vandenbroucke JP, et al. Declaración de la iniciativa STROBE (Strengthening the Reporting of Observational Studies in Epidemiology): directrices para la comunicación de estudios observacionales [The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement: guidelines for reporting observational studies]. Rev Esp Salud Publica. 2008;82(3):251-9. Spanish
26. Ginting H, van de Ven M, Becker ES, Näring G. Type D personality is associated with health behaviors and perceived social support in individuals with coronary heart disease. J Health Psychol. 2016;21(5):727-37.
27. Matos AP, Sousa-Albuquerque CM. Estilo de vida, percepção de saúde e estado de saúde em estudantes universitários portugueses: influência da área de formação [Lifestyle, health awareness and health status among Portuguese university students: influence of the training area]. Int J Clin Health Psychol. 2006;6(3):647-63. Portuguese

Disclosure statement

The authors declare that they have no conflict of interests.

O artigo foi recebido em 10.12.2017 e aprovado em 05.07.2018.